

# Understanding Universal Processes at Earth by Exploring the Solar System

Dorelli (673), Clark (670), Collinson (673), Gershman (673), ...

Mercury &  
MESSENGER

Comet 67P &  
Rosetta

Magnetic Reconnection

Shock Heating

Magnetic Reconnection

Polar Wind Outflow

Venus &  
Venus Express

Ganymede &  
Hubble

Studying 4 different objects using 4 different missions (combined with theory and modeling) offers new and valuable perspectives on some fundamental physical processes that occur throughout the universe and in particular at Earth.

# NOTES

- Earth is the most studied magnetosphere, affording us a very detailed look at phenomena that are more difficult to observe at other objects.
- Earth lives in a very narrow range of parameter space -> studying other solar system objects is the closest we get to experimenting with the parameters (different spatial and energy scales)
- **Comet 67P** allows us to study **heating at shocks** (shock heating is an important design consideration for spacecraft re-entry)
- **Mercury and Ganymede** allow us the study **magnetic energy release, reconnection** (reconnection is important throughout the universe)
- **Venus** allows us to better understand **particles flowing out the poles** and the ionosphere (ionosphere is critical for HF communication and an important part of our atmosphere)
- **What's next? MMS!!**